New Nyssoninae from North and South America

(Hymenoptera : Sphecidae)

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One new genus and 7 new species of Nyssonine wasps are described below in order to facilitate a generic revision of Sphecidae. This study was supported in part by National Science Foundation grant GB-5839.

Holotypes of the new species will be deposited in the Entomology Museum of the University of California at Davis except as follows: *Antomartinezius fritzi* in the Miguel Lillo Institute, University of Tucumán, Argentina; *Neonysson herbsti* in the California Academy of Sciences, San Francisco.

Neonysson R. Bohart, new genus

TYPE OF GENUS: *Nysson porteri* Ruiz.

GENERIC DIAGNOSIS.—Clypeus concave apically and thin-edged, ridged above apex to give beveled appearance; labrum dark, rounded, showing only slightly beneath clypeus; basal flagellar articles slender in female, stout in male except for flagellomere I; last male flagellomere incurved beneath, longitudinally seamed, larger than preceding article; front slightly swollen above antennal bases and with short raised median line; inner eye margins converging moderately below, evenly emarginate above.

Forewing with three submarginal cells, second petiolate and receiving both recurrent veins; marginal cell pointed distally and ending at costal margin; second and third submarginal cells unusually small, former sometimes smaller than stigma; hindwing media diverging far beyond cu-a; jugal lobe larger in outline than tegula; pulvilli present; female foretarsus without recognizable comb; male midtibia two-spurred; posterior surface of hindtibia with many small teeth rather generally distributed; outer apex of hindtibia rounded and spinose; outer apex of hindfemur not spoonlike; metanotum simple; propodeal spines small but prominent, flattened dorsoventrally; stout tooth well above hindcoxa, projecting outward and backward (Fig. 10).

Abdomen moderately stout, segments single-edged, simple, not fringed with flattened setae; female sternite VI sharply convex and with weak median carina; female pygidium narrowly platelike, rounded or rather blunt apically (Fig. 8); male sternites II to V with double row of narrow hair tufts which divide sternites in three nearly equal parts (Fig. 12); male tergite VII bidentate and with strong median lobe.

The two known species are from Chile. In most respects *Neonysson* is in morphological agreement with *Brachystegus* which occurs in Africa and Eurasia. The two important characters in common are the multidentate posterior surface of the hindtibia in combination with the three submarginal cells of the forewing. The only other genera approaching this condition are *Acanthostethus* which has only two submarginal cells,

and *Zanysson* which has the hindtibial teeth large and arranged in a single regular row. *Neonysson* differs from all of these by its simply edged abdominal segments and by the projecting tooth below each propodeal spine (Fig. 10). Other differences of possible generic significance are the double row of hair tufts on the sternites of male *N. porteri,* (Fig. 12), and the rather "duck-billed" propodeal spines.

Neonysson herbsti R. Bohart, new species

FEMALE HOLOTYPE.—Length 6.0 mm. Head and thorax mostly black, abdomen mostly red. Ivory are: pronotal lobe, large spot inside humerus and occupying outer one-third of pronotum above, distal spot beneath fore- and midfemur, transverse apicolateral spots on tergites I to III. Abdomen dark brown on segment VI and tergite V. Wings light brownish. Pubescence moderate, silvery and rather thick on frons and propodeum dorsolaterally, sparse and fulvous on scutum. Punctation moderate, clypeal bevel and metapleuron polished, frons and vertex with close small punctures, frons with scattered macropunctures; notum with close and medium punctures, becoming slightly striate on scutellum and metanotum; front surface of each femur polished; abdomen with fine and mostly well separated punctures, those at widest part of tergite II separated by two or more diameters; pygidial plate finely striatopunctate. Face (as in Fig. 9); pronotum rather flat above, nearly smooth toward obtusely rounded humeri, lower angle present as seen from above, but not spinelike, mesopleuron moderately areolate, propodeal enclosure channeled medially and otherwise with oblique coarse areolae, hind face of propodeum with broad median triangle and transversely carinate sublateral grooves; pygidial plate narrow, rounded at apex (Fig. 8) which exceeds end of sternite VI; sternite II moderately convex, VI bristly toward apex.

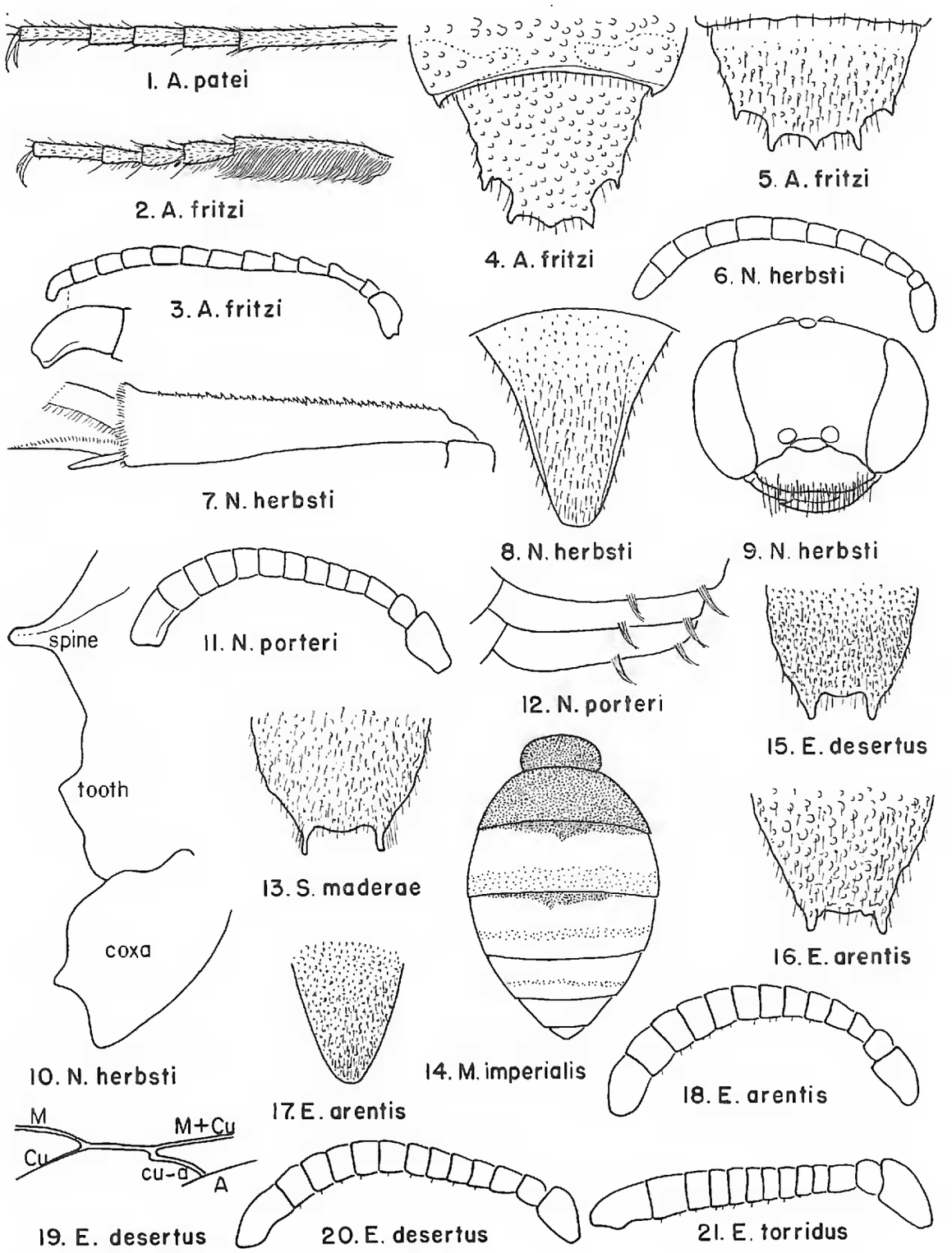
MALE.—Unknown.

Holotype female (California Academy of Sciences), VINA DEL MAR, CHILE, 5 November 1919 (P. Herbst).

The unique type is structurally very close to *Neonysson porteri* Ruiz, of which a pair was sent to me by Manfredo Fritz. Herbst realized that he had an undescribed species because he had attached a manuscript species label (as a *Nysson*) to the pinned specimen. The obvious difference between the two species lies in markings. In *N. porteri* only the first tergite of the female is extensively red (the male has all black ground color). Otherwise, the punctation of the scutum is close in *N. herbsti* rather than corrugated, the pronotal ridge is rather smoothly rounded toward the humeri rather than ridged, the punctation of the abdomen is much finer and more widely spaced, and the pygidial plate is narrowly rounded apically rather than subtruncate.

Epinysson arentis R. Bohart, new species

MALE HOLOTYPE.—Length 5.5 mm. Head and thorax mostly black, abdomen mostly red. Ivory are: pronotal ridge and lobe, apicolateral spots on tergites I



FIGS. 1–5, *Antomartinezius*. FIGS. 1–2, male midtarsus. FIG. 3, male antenna. FIG. 4, female tergite VI. FIG. 5, male tergite VII. FIGS. 6–12, *Neonysson*. FIG. 6, female antenna. FIG. 7, female hindtibia. FIG. 8, female tergite VI. FIG. 9, female face. FIG. 10, profile of lateroposterior edge of propodeum and hindcoxa, female. FIG. 11, male antenna. FIG. 12, oblique lateroventral view of sternites III to V, male. FIG. 13, *Synneurus maderae*, male tergite VII. FIG. 14, *Mellinus imperialis*, semiposterior view of male tergal pattern. FIGS. 15–21, *Epinysson*. FIGS. 15–16, male tergite VII. FIG. 17, female pygidium. FIGS. 18, 20–21, male antenna. FIG. 19, detail of hindwing venation in area of crossvein cu-a.

to V; red are: mandible mostly, legs extensively including hindlegs beyond trochanter; ground color of abdominal segments I and II, broadly broken medially on II by a black spot; wings slightly smoky, especially in marginal cell and apically. Body with moderate silvery pubescence, thickest on clypeus, frons and mesopleuron, that on frons nearly obscuring punctation. Punctation mostly moderate, macropunctures somewhat separated, interspersed with micropunctures; interocellar area shiny, irregularly and sparsely punctate on either side of longitudinal crease; metapleuron shiny below, faintly pebbled. Free margin of clypeus almost evenly convex, antenna (Fig. 18) with flagellomere I about as broad as long, slightly longer than II, last article only slightly deformed; pronotal humeri completely rounded off; hindwing media diverging 2.0 midocellus diameters beyond cu-a; metanotum slightly roughened longitudinally; propodeal enclosure irregularly and longitudinally areolate, posterior face of propodeum striatopunctate, median triangle visible, dorsolateral tooth small and sharp; tergite VII ending in low lobe flanked by slender teeth (Fig. 16); sternite II moderately convex.

FEMALE.—About as in male. Abdomen more extensively red, including sides of tergites III to V, all of VI and venter. Pygidium wedge-shaped, narrowly rounded apically, surface granulopunctate (Fig. 17).

Holotype male (UCD), BORREGO VALLEY, SAN DIEGO COUNTY, CALIFORNIA, 19 April 1957 (R. M. Bohart). Paratypes, 6 males, 11 females, all from California: Borrego Valley (E. I. Schlinger, P. D. Hurd, R. M. Bohart, J. G. Rozen); Deep Canyon, Riverside Co. (M. E. Irwin); 1000 Palms Canyon, Riverside Co. (F. D. Parker); Cajon Pass, San Bernardino Co. (J. C. Hall); near Gorman (P. D. Hurd); Bigpine (R. M. Bohart); Antelope Springs, Inyo Co. (D. R. Miller); Arroyo Seco Camp, Monterey Co. (R. C. Bechtel, R. M. Bohart). Paratype dates were from 18 April to 1 July. Metatypes, 2 females, 10 mi. SE Henderson, Nevada (P. Torchio *et al.*); Wickenburg, Arizona (P. Torchio and G. Bohart).

The completely rounded humeri, distal divergence of the hindwing media, non-tuberculate interocellar area, and all dark scutellum characterize both *E. arentis* and *E. pacificus* Rohwer. From the latter, *E. arentis* differs by the creased and sparsely as well as irregularly punctate interocellar area. *Epinysson pacificus* is a darker species, also, particularly on the abdomen; and the mesopleuron is roughened rather than simply punctate.

Epinysson desertus R. Bohart, new species

MALE HOLOTYPE.—Length 5.0 mm. Black, ivory, and red. Ivory are: mandibular spot, scape and pedicel in front, broad stripe across top of pronotum, but interrupted at humeri, outer subapical spots on tibiae, stripe across front of scutellum, transverse apicolateral spots on tergites I to IV, those on I and II separated by about twice their breadth; red are: mandible partly, prothorax and legs mostly (tarsi darker), metapleuron and propodeum except enclosure, abdomen except for ivory spots; wings slightly smoky, especially in marginal cell. Pubescence fine,

short and silvery, tarnished on upper frons; thick on face below ocelli, on mesopleuron where it almost obscures sculpture, and above propodeal teeth. Punctation mostly fine to moderate, scattered small macropunctures below midocellus, superimposed on micropunctation, between ocelli, and on tergites where punctation is stronger toward apex; mesonotum with coarse punctation which is partly obscured by micropunctation; mesopleuron obscurely reticulate; metapleuron shiny, faintly shagreened. Free margin of clypeus almost evenly convex, antenna (Fig. 20), flagellomere I barely longer than II in front view, last article distinctly pointed; interocellar area swollen, rising well above level of ocelli, lateral ocellus 3.5 times its breadth from lateral margin; pronotal humeri completely rounded off; hindwing media diverging about 3.0 midocellus diameters beyond cu-a (Fig. 19); metanotum roughened; propodeal enclosure irregularly areolate, posterior face of propodeum with four main longitudinal carinae, middle two enclosing a long triangle narrowing below to a rounded apex, dorsolateral tooth small and sharp; tergite VII slightly lobed between slender teeth (Fig. 15); sternite II weakly humped toward base.

FEMALE.—About as in male. Tergal spots separated by once to twice their breadth. Pygidium wedge-shaped, narrowly rounded apically, surface granulopunctate.

Holotype male (UCD), 18 MILES WEST OF BLYTHE, RIVERSIDE COUNTY, CALIFORNIA, 14 October 1967 (R. M. Bohart). Paratypes, 10 males and 16 females collected with holotype (D. Horning, Jr. and R. Bohart). Metatypes, 1 male, Granite Pass, Hidalgo Co., New Mexico, 22 August 1958 (P. Hurd); 2 females, 3 mi. N Elota, Sinaloa, Mexico, 18 March 1962 (F. D. Parker).

This species appears closest to *E. metathoracicus* (H. Smith) with which it shares the rounded humeri, distal divergence of the hindwing media, spotted scutellum, small and sharp propodeal teeth, and raised but uncreased interocellar area. In *E. desertus* the interocellar area rises well above the level of the ocelli and the lateral ocellus is three or more times its breadth from the ocular margin instead of about twice its breadth. Also, the tergal punctation is considerably less coarse in *E. desertus*. One variation noted in *E. desertus* is the presence in some males of two pale spots beneath the silver pubescence of the clypeus.

Epinysson torridus R. Bohart, new species

MALE HOLOTYPE.—Length 6.0 mm. Head and thorax mostly black, abdominal ground color red and black. Ivory are: mandible basally, scape and pedicel in front, basal flagellomeres dimly, complete pronotal band, anterior band on scutellum, apicolateral spots on tergites I to V, separating interval small on I but becoming gradually broader posteriorly; red are: mandible apically, inner surface of flagellum brownly, legs extensively, abdomen mostly except for dark median area on tergites II to VII. Body with silvery pubescence, tarnished on upper frons and notum, thick and obscuring punctation on clypeus, frons and mesopleuron; wings brown-stained. Punctation mostly moderate, coarse on mesonotum and

mesopleuron, macropunctures of abdomen mostly well spaced by areas of micropunctation; metapleuron smooth and shiny below. Clypeus with broadly rounded lobe apicomedially; antenna (Fig. 21) with basal nine articles broader than long, last one as long as two previous articles together; interocellar area with two large and high tubercles which are mostly smooth, deeply divided by median crease; prehumeral corners (just behind head) sharp in dorsal view; pronotal humeri completely rounded off; hindwing media diverging about 2.5 midocellus diameters beyond cu-a; metanotum longitudinally carinate; propodeal enclosure with anterior row of short longitudinal areolae, otherwise rather irregularly areolate, posterior face of propodeum with median triangle and submedian area set off by carinae, surface subareolate, dorsolateral tooth small and flattened dorsally. Tergite VII truncate apically between two stout, sharp teeth (about as in Fig. 16); sternite II moderately convex.

FEMALE.—About as in male. Flagellomere I slightly longer than broad. Pygidium wedge-shaped, narrowly rounded apically.

Holotype male (UCD), PALM CANYON, BORREGO VALLEY, SAN DIEGO COUNTY, CALIFORNIA, 19 April 1957 (R. M. Bohart). Paratypes, 7 males and 10 females from California: Borrego Valley (R. W. Bushing, E. I. Schlinger, J. C. Hall, M. Wasbauer, R. M. Bohart); Gavilan (P. H. Timberlake); Antelope Springs, Inyo Co. (D. R. Miller, G. I. Stage); 20 mi. SE Williams (R. M. Bohart). Other paratypes, 3 pair from Nevada: Valmy (T. R. Haig), 16 mi. NW Gerlach (F. D. Parker), Nixon (R. C. Bechtel). Paratype dates are 19 April to 25 August.

There is some variation among paratypes with respect to amount of red versus black coloration. Some specimens have the abdomen mostly red and others have mostly black ground color beyond tergite I.

The combination of rounded humeri, sharp prehumeri, distal divergence of the hindwing media, and maculate scutellum characterize *E. metathoracicus* as well as *E. torridus*. The latter differs especially by its strongly raised and nearly smooth interocellar tubercles. In *E. metathoracicus* the interocellar area is a little raised, but essentially flat, not creased.

Synneurus maderae R. Bohart, new species

MALE HOLOTYPE.—Length 10.0 mm. Body black with ivory markings. Ivory are: scape and pedicel in front, complete pronotal band, posterolateral scutal spot, anterior bands on scutellum and postscutellum, coxal spots, small femoral spots, tibiae externally, broad apical bands on tergites I to V, broken band on VI, lateral dot on sternite VII; red are: mandible mostly, flagellomere I partly, legs partly. Body with fine silvery to golden pubescence, thickest and silvery on clypeus and lower frons; wings lightly smoky, marginal cell contrastingly and evenly brown. Punctation mostly coarse with micropunctures interspersed, pronotal band sparsely punctate, mesopleuron with macropunctures well separated by smooth integument, metanotum smooth and nearly impunctate. Clypeus with rounded, apicomedial projection; antenna with pedicel short, and cartwheel-shaped flagel-

lomeres I to IX broader than long, I to III subequal in length, X and XI each as long as VIII and IX together, XI concave and twisted, flagellomeres without conspicuous hairs beneath; interocellar area flat, lower than ocelli; omaulal area of mesopleuron completely rounded over except ventrally, posterior slope of mesopleuron not defined anteriorly by a ridge except traces above and below; metapleuron shiny and smooth in lower two-thirds; hind basitarsus slender, longer than rest of tarsus; propodeal enclosure with about 10 strong and nearly straight longitudinal carinae defining long areolae, posterior face areolate, median triangle distinct, dorsolateral tooth very short, rounded, flattened dorsoventrally. Tergite VII ending in a low median lobe flanked by slender teeth, no matted pubescence (Fig. 13); sternite II strongly bowed out at basal one-third, forming median rounded hump.

Holotype male (UCD), MADERA CANYON, SANTA RITA MTS., SANTA CRUZ COUNTY, ARIZONA, 2 July 1963 (V. L. Vesterby).

This species belongs to the group containing *S. aurinotus* Say and *S. compactus* Cresson. Species of this group have male tergite VII with ordinary, fine pubescence rather than thick, matted hair as in *S. aequalis* Patton, *S. plagiatus* Cresson, and *S. intermedius* Viereck. From the other species of its group, *S. maderae* is separated easily by the banded tergites, banded and nearly smooth metanotum, rounded omaulal area, and the exceptionally short and rounded propodeal tooth.

Antomartinezius fritzi R. Bohart, new species

MALE HOLOTYPE.—Length 8.0 mm. Black, white, and red. White are: mandible basally, labrum, clypeus, upper orbital spot, postorbital dot, pronotal lobes and two transverse spots on crest, posterolateral scutal dot next to lateral scutellar spot, outer stripe on tibiae as well as on basitarsi of fore- and midlegs, apical marks on tergites I to V as follows: narrow band interrupted sublaterally on I, submedian and lateral dots on II, lateral spots on III to V, transverse on IV and V; red are: tergites I to IV except for white marks, V laterally; wings nearly clear, stained in marginal cell and at wing apex. Pubescence silvery-white, dense mat on clypeus, frons, mesopleuron, metanotum, propodeum laterally above, and venter of thorax; mid basitarsus with dense erect hair beneath nearly as long as second tarsomere (Fig. 2); broad hair brushes from apices of sternites II to V. Clypeus with narrow vertical bevel, antenna (Fig. 3), mesonotal punctures large and moderately spaced, propodeal enclosure longitudinally areolate; recurrent veins both received by second submarginal cell. Tergite VII with 5 equally spaced teeth (Fig. 5).

FEMALE PARATYPE.—About as in male but clypeus with two large white spots, long inner orbital stripe, tarsi dark, mid basitarsus not unusually pubescent, tergite VII with four teeth and median angle (Fig. 4).

Holotype male (Miguel Lillo Institute), AMAICHA, TUCUMÁN, ARGENTINA, 20 November 1966 (L. A. Stange). Paratype female (M. Fritz collection), Glot. Roca, Río Negro, Argentina, January, 1962 (Bachmann).

A. fritzi is similar in most respects to the type of the genus, *A. patei*

Fritz. The two species share the following generic characters: hindtibia without teeth posteriorly, most sternites and tergites lobate laterally, frons with a Y-shaped crest above antennae, no pulvilli between tarsal claws, female foretarsus with a well developed comb. *A. fritzi* differs from *A. patei* by the somewhat larger size of the former, the slightly broader frons, the unusual pubescence of the male midtarsi (compare Figs. 1, 2) and the more evenly spaced teeth of the last visible tergite. The species is named for Manfredo Fritz who has contributed greatly to our knowledge of South American Nyssoninae.

Mellinus imperialis R. Bohart, new species

MALE HOLOTYPE.—Length 9.0 mm. Black with little yellow on thorax, much on abdomen. Yellow are: scape and pedicel beneath, thin line on inner orbit of frons, line across pronotal ridge, forefemur and midfemur distally in front, foretibia and midtibia in front, broad bands on tergites II and following (as in Fig. 14) (black bases of succeeding tergites show through yellow on III and IV), sternites V and following mostly; reddish to fulvous are: mandible partly, flagellum beneath on first 7 articles, wing bases and veins mostly; wings very faintly yellowed, stigma brown. Pubescence pale, short, mostly inconspicuous. Punctation very fine and close, interocellar area dull and without separated punctures. Clypeus nearly flat, median apex truncate surmounted by three small callosities, lateral ones transverse along edge of truncation and middle one longitudinal, but not protruding apically; flagellomere I about twice as long as wide, distinctly longer than either II or III; distance between lateral ocelli about equal to ocellocular distance; pronotal ridge unusually thin; petiole about twice as long as breadth or height, exposed part of sternite VIII narrowly wedge-shaped and angularly emarginate apically.

FEMALE.—About as in male; length 10.0 mm. Midtooth of clypeus a denticle protruding over margin; flagellum mostly dark beyond first article; pygidium broadly wedge-shaped, apically with slightly convex truncation, clothed with scattered long pale hairs.

Holotype male (UCD), BARD, IMPERIAL COUNTY, CALIFORNIA, 22 March 1954, taken sweeping alfalfa (R. Van den Bosch). Paratypes, 5 males, 2 females, Mexico: Alamos, Sonora (P. H. Arnaud, CAS, UCD); Guaymas, Sonora (E. P. Van Duzee, CAS); 1 female, California: Bard, Imperial Co., at light (Calif. Dept. Agric. Coll.). Paratype dates are in February and April.

The broad, deep yellow abdominal bands and practical absence of red markings distinguish this species at once from all other described North American forms. However, it is structurally very close to *M. rufinodus* Cresson, sharing with that species the conformation of the clypeus (but apex in male flat in *M. imperialis*, rather than humped), antennae, legs, and abdomen. The male genitalia of the two are apparently alike. Yet, the two are separated by the color pattern of

the antennae, notum, legs, and abdomen. The clypeal difference noted above is seen best in end-on view. It is reflected in the female *M. imperialis* by a slightly more depressed middle tooth. Another less definable difference lies in the pronotal ridge which is more sharply rounded in *M. imperialis* than in *M. rufinodus*.

Some Intertidal Insects from Western Mexico

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In the fall of 1966 I accompanied an expedition from Stanford's Hopkins Marine Station on an intertidal collecting trip in the Gulf of California and farther south. My objective was to collect intertidal insects, pseudoscorpions and chilopods because I happened to be investigating the ecology of the intertidal insects of California at that time. I also wanted to find out whether any of the Californian representatives of these forms are found on the Mexican mainland extending from about the middle of the Gulf at Guaymas, Sonora, to Barra De Navidad in the State of Jalisco. This stretch of coast, which is about a thousand miles in length, comprises a distinct marine littoral faunal zone, the Subtropical, along with the southern tip of Baja California and the Hawaiian Islands. The northern half of the Gulf, as well as the region extending southwards from Point Conception, California, to more than halfway down the west coast of Baja California constitutes the Warm-temperate region, while the region south of Acapulco, Mexico, is designated Tropical (Abbott, 1966; Ekman, 1953; Garth, 1955).

Collecting was done, for the most part, on rocky shores at low tide by watching for insects moving among barnacles, mussels or littorine molluscs or by prying open crevices in rocks with a crowbar and geological hammer.

Ensenado Lalo, the most northerly of the collecting areas, is situated west of Bahia San Carlos, Sonora, Mexico, and on 28–30 October several interesting intertidal insects were found in the barnacle (*Chthalamus*)—coralline algae (*Lithothamnium lamellatum* Setchell and Foslie) zone which forms a conspicuous white band on the upper tide level of the rocks at that time of the year. Normally *L. lamellatum* is whitish-pink but due possibly to the high temperatures of summer

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